

35	--	claim 11	pg. 7, ln. 10-11
36	--	claim 12	pg. 7, ln. 11-14
37	claim 12	claim 13	pg. 9, ln. 12-21
38	claim 13	claim 14	pg. 9, ln. 21-23
39	claim 14	claim 15	pg. 5, ln. 12-21; pg. 12, ln. 1-3
40	claim 15	claim 16	pg. 8, ln. 11-14
41	claim 16	claim 17	pg. 9, ln. 1-6
42	claim 17	claim 18	pg. 9, ln. 7-8
43	claim 18	claim 19	pg. 8, ln. 15-18
44	claim 19	claim 20	pg. 5, ln. 12-21; pg. 11, ln. 22-25
45	claim 20	claim 21	pg. 11, ln. 22 through pg. 12, ln. 3
46	claim 21	claim 22	pg. 11, ln. 4-11; pg. 10, ln. 1-4
47	claim 22	claim 23	pg. 11, ln. 4-11
48	claim 23	claim 24	pg. 10, ln. 1-4

To remedy the confusion over the status of the claims due to the Examiner not having received a copy of the annexes to the IPER, applicant has cancelled claims 1-23 and submitted new claims 24-48. A copy of the pages from the annex to the IPER is provided in Exhibit 1 to provide a complete record for the Examiner.

***Claim Rejections - 35 U.S.C. § 112, Second Paragraph***

The Examiner has rejected claim 1 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner asserts that:

Claim 1 is indefinite because it is not known what the citation "wherein the starch complex.....in the case of hydrophobic biodegradable polymers" means. Furthermore use of adjective "the" in line 13 before "aliphatic" is confusing because these moieties have never been referred to earlier. Terms "polyamides-polyesters", "polyurethane-polymides", "polyurea-polyesters" are indefinite because it seems that each one is meant to represent a copolymer. If it is so, then proper terminology may [be] "amide ester copolymers" etc.

(Paper 7, page 2-3).

Applicants submit that submission of the new claims has rendered the rejection moot. New claim 24 does not utilize the "wherein" clause objected to by the Examiner or to any moieties not previously referred to. Applicants submit that the rejection does not apply to the newly submitted claims and should not be reapplied.

***Claim Rejections - 35 U.S.C. § 103(a)***

The Examiner has rejected claims 1-23 under 35 U.S.C. 103(a) as being unpatentable over Bastioli et al (WO 98/20073) in view of Corvasce et al (EP 0795581) and Bastioli et al (EP 0965615). Applicants respectfully traverse the rejections and submit that a proper *prima facie* case of obviousness has not been made out.

The criteria and Examiner's burden for making a *prima facie* case of obviousness in accordance with MPEP Section 706.02(j) are as follows (emphasis and numbers added):

To establish a *prima facie* case of obviousness, three basic criteria must be met. (1) First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. (2) Second, there must be a reasonable expectation of success. (3) Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. . . .

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." . . .

Further, case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references, and that that such

references can be combined only if there is some suggestion or incentive to do so. In re Sang-Su Lee, 61 U.S.P.Q.2d 1430 (CAFC 2002).

#### **Bastioli '073 In View Of Corvasce And Bastioli '615**

The Examiner asserts that:

Bastioli '073 discloses biodegradable polymer compositions comprising starch and a thermoplastic polymer. The polymer can be an aliphatic-aromatic copolyester, polyester-amide or polyester-urethane all of which read on those in instant claim 1. Compositions are used to make films, laminated paper bags etc. (p. 51, claims 41-43).

Bastioli fails to disclose a starch complex and coupling agents.

Corvasce discloses a rubber composition containing a starch/plasticizer composite, an elastomer, optionally a coupler and optionally a carbon black as well as silica (abstract). On page 2, line 53 to page 3, line 16, several suitable coupling agents are mentioned. They read on those that are instantly claimed.

Bastioli '615 discloses complexed starch-containing compositions having high mechanical properties. Starch forms complexes with synthetic polymers such as polyethylene, vinyl alcohol or polyethylene acid acrylate (p. 2, lines 46-47) and such complex acts as a compatibility-inducer or phasing agent. (Paper 7, page 3-4).

The Examiner then concludes by asserting that:

Therefore, it would have been obvious from the teachings of Corvasce, to use coupling agent/s in the composition of Bastioli ('073) in order to improve mechanical strength of the product made out of that composition. It would have been obvious, from the teachings of Bastioli ('615) to use a complexed starch in lieu of starch in the composition of Bastioli ('073) since a complexed starch imparts better resistance to ageing. (Paper 7, page 4).

The Examiner appears to be reasoning that it would have been obvious to simultaneously substitute a starch complex for starch in Bastioli '073 and also to introduce a coupling agent that would bind said newly substituted starch complex to the polymer matrix, supposedly because one of skill in the art would seek to "improve mechanical strength" and "resistance to aging".

Applicants respectfully submit that the Examiner has not made a proper prima facie case of obviousness because one of skill in the art would have had no motivation to combine the disclosures in the manner the Examiner proposes. The Examiner fails to appreciate that the interaction of the chemical moieties in the compositions of Corvace, Bastioli '073, Bastioli '615, and the present invention are significantly different and that such differences are so great that one of skill in the art would not be motivated to modify Bastioli '073 with Corvace and Bastioli '065 in a manner that would yield the present invention.

First, as the Examiner readily admits, while Bastoli '073 does disclose biodegradable compositions of starch dispersed inside a matrix of the thermoplastic polymer that is incompatible with starch (e.g., an aliphatic polyester), it fails to disclose a starch complex and coupling agents. Instead, the Examiner relies on Corvace to try and fill the missing combination of elements.

Corvace discloses a rubber composition containing a starch/plasticizer composite, optionally having a coupling agent used in combination with a reinforcing agent such as carbon black and/or silica (Corvace, Abstract). The coupling agent contains two moieties; one moiety to interact chemically or physiochemically with the reinforcing agent (e.g., with hydroxyl groups on the surface of silica (SiOH groups)) and the other moiety to react with one or more of the elastomers, particularly diene-based sulfur curable elastomers (Corvace, p. 2, lines 53-55). In this manner the coupling agent acts as a connecting bridge between the reinforcing agent and the rubber and thereby enhances the reinforcement of rubber (Corvace, p. 3, lines 3-5). Usually the moiety of the coupling agent that is reactive towards rubber is temperature sensitive and tends to combine with the rubber during the final and higher temperature sulfur vulcanization stage.

Because this is subsequent to the rubber/silica/coupler mixing stage, the silene groups of the coupler have already combined with silica (p. 3, lines 7-10).

Based on such teachings, applicants respectfully submit that Corvasce does not at all teach or suggest improving mechanical properties (e.g., reinforcement), as asserted by the Examiner, by adding to, or reacting with, a starch complex. This is so, because, as described above, both the reactive moieties in the coupling agents of Corvace's rubber compositions are engaged in the reaction with the reinforcing agent and the rubber, not the starch. The presently claimed starch complex is completely different than the reinforcing agent and the rubber of Corvace. For this reason alone, applicants submit that a proper prima facie case has not been made and the rejection should be withdrawn.

Applicants further point out that the Examiner's assertion is not supported because the reaction of the rubber in Corvace does not occur by simply mixing the rubber, the coupler, and the reinforcing agent; no, the reaction is temperature sensitive and occurs only during the final and higher temperature sulfur vulcanization stage. For this additional reason, one of ordinary skill would not be in position to predict that the coupling agents used by Corvasce would successfully react with the starch complex present in the compositions of Bastioli ('073) or with the polymer forming the matrix of said compositions.

We now turn to the Examiner's assertions regarding the substitution of a complexed starch in lieu of starch in the composition of Bastioli ('073) because a complexed starch imparts better resistance to ageing. Bastioli ('615) discloses compositions comprising starch, a thermoplastic polymer incompatible with starch, and a plasticizer, in which starch forms the dispersed phase and the thermoplastic polymer the continuous phase. As a consequence of the preparation conditions, a complex of starch and the incompatible polymer forms to a

concentration that reaches a maximum when the quantity of the plasticizer is within a critical range (2-8 wt% for glycerin) and the specific energy of extrusion is higher than a certain value (0.15 Kwh./Kg). The presence of the starch-complex is revealed by FTIR spectra or X-ray diffraction spectra. The mechanical properties of the compositions remarkably increase when the concentration of the starch complex reaches a maximum.

The compositions of Bastioli '073 do contain the same starch-incompatible polymer complex that is present in the compositions of Bastioli '615, however, applicants point out that the critical plasticizer concentration range, and thus the critical maximum concentration for the complex, as taught by Bastioli '615, are not achieved in the compositions of Bastioli '703. Thus, the physical properties of the compositions, and the constituents from which they derive, are quite different. Applicants respectfully submit that these differences would not indicate to one of skill in the art the presently claimed invention.

Applicants further point out that even if the compositions of Bastioli '615 were combined with those of Bastioli '703, the claimed invention would still not be achieved. In the compositions of both Bastioli '615 and Bastioli '703, no external coupling agents are present. By definition, an external coupling agent reacts with the polymer matrix and the starch complex. The starch complex has no reactive groups available to react with the polymer matrix of composition of Bastioli ('073) because said groups are engaged in the formation of the complex.

Because both Bastioli '615 with Bastioli '073 do not teach, or suggest, the use of external coupling agents one of skill in the art would have no motivation to combine an external coupling agent with either Bastioli '615 or Bastioli '703 these compositions cannot render obvious the compositions of the claims.

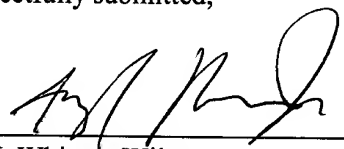
### CONCLUSION

In view of the foregoing, favorable action on the merits, including withdrawal of the rejections, and allowance of all the claims, is respectfully requested. If the Examiner has any questions regarding this paper, please contact one of the undersigned attorneys.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Commissioner for Patents, Washington, D.C. 20231, on October 1, 2002.

  
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Respectfully submitted,

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